

In the Claims

Please amend claims 1, 13 and 22 and cancel claims 6-8 and 19-21 without prejudice or disclaimer to the subject matter contained therein as shown below. Also, the current status for all of the claims in the present application is provided.

1. (Currently Amended) A pressure relief valve comprising:

a housing having a passage formed therein for connection with a fluid source and a seal surface positioned about an opening in the passage, the housing including a discharge opening for relieving pressurized fluid from the housing during operation of the relief valve;

a valve member positioned within the housing, the valve member being movable along an axis within the housing to selectively engage the seal surface in a sealing relationship, the housing being sized and shaped to substantially restrict movement of the valve member to a direction parallel to the axis by an arrangement of through-holes in the valve member to restrict fluid flow when the valve member is in a closed position during normal operating conditions with the seal surface being engaged in the sealing relationship and when the valve member is separated from the seal surface, the through-holes permit fluid to flow through the valve member, the through-holes are commonly shaped and sized depending on the desired volume of fluid pressure to be relieved by the valve and the size of the opening in the passage and are symmetrically arranged in a circular pattern and evenly spaced about the circumference of the valve member such that the diameter of the circular pattern is greater than the width of the opening in the passage for allowing fluid to evenly dissipate through the valve member so that a proper alignment of the valve member is maintained as the valve member moves from the closed position to an open position; and

a spring coupled to the valve member and a portion of the housing, the spring applying a predetermined spring force to the valve member to bias the valve member into contact with the seal surface, said predetermined spring force maintaining the valve member in the closed position during the normal operating conditions and

wherein the valve member separates from the seal surface upon application of a fluid pressure force on the valve member that is greater than the predetermined spring force thereby allowing pressurized fluid to pass through the through-holes and the discharge opening in the housing when an over pressure condition exists by the fluid pressure exceeding the predetermined spring force.

2. (Original) The relief valve of claim 1, wherein the valve member has one or more through-holes formed therein.
3. (Original) The relief valve of claim 2, wherein the one or more through-holes are arranged on the valve member to inhibit fluid flow through the through-holes when the valve member is sealing engaged with the seal surface
4. (Original) The relief valve of claim 3, wherein the seal surface is generally annular in shape.
5. (Original) The relief valve of claim 4, wherein the valve member is disk-shaped having a generally circular bottom surface for engaging the seal surface.
6. (Cancelled) The relief valve of claim 5, wherein the holes are arranged in a circular pattern about the circumference of the bottom surface.
7. (Cancelled) The relief valve of claim 2, wherein the through-holes are uniformly spaced about the valve member.
8. (Cancelled) The relief valve of claim 7, wherein the through-holes are commonly sized and shaped.
9. (Original) The relief valve of claim 1, wherein the seal surface has an annular groove formed therein for receiving an elastomeric seal ring.

10. (Original) The relief valve of claim 1, wherein the valve member includes a spring recess sized to receive at least an end of the spring.
11. (Original) The relief valve of claim 10, wherein the spring recess is centered on the axis of motion of the valve member.
12. (Original) The relief valve of claim 1, wherein the housing includes a second spring recess sized to receive another end of the spring, the second spring recess being aligned with the spring recess in the valve member.
13. (Currently Amended) A pressure relief valve comprising:
- a housing having a passage formed therein for connection with a fluid source and a seal surface positioned about an opening in the passage, the housing including a discharge opening for relieving pressurized fluid from the housing during operation of the relief valve;
 - a valve member positioned within the housing, the valve member being movable in a reciprocating manner along an axis within the housing to selectively engage the seal surface of a base in a sealing relationship, the valve member having an arrangement of one or more through-holes formed therein to restrict fluid flow when the valve member is in a closed position during normal operating conditions with the seal surface being engaged in the sealing relationship and when the valve member is separated from the seal surface, the through-holes permit fluid to flow through the valve member, the through-holes are commonly shaped and sized depending on the desired volume of fluid pressure to be relieved by the valve and the size of the opening in the passage and are symmetrically arranged in a circular pattern and evenly spaced about the circumference of the valve member such that the diameter of the circular pattern is greater than the opening in the passage for allowing fluid to evenly dissipate through the valve member so that a proper alignment of the valve member is maintained as the valve member moves from the closed position to an open position; and
 - a spring coupled to the valve member and applying a predetermined spring force to the valve member to bias the valve member into contact with the seal surface, said

predetermined spring force maintaining the valve member in the closed position during the normal operating conditions and wherein the valve member separates from the seal surface upon application of a fluid pressure force on the valve member that is greater than the predetermined spring force thereby allowing pressurized fluid to pass through the through-holes in the valve member and out of the valve through the discharge opening in the housing when an over pressure condition exists by the fluid pressure exceeding the predetermined spring force.

14. (Original) The relief valve of claim 13, wherein the seal surface is generally annular in shape.

15. (Original) The relief valve of claim 14, wherein the valve member is disk-shaped having a generally circular bottom surface for engaging the seal surface.

16. (Original) The relief valve of claim 15, wherein the holes are arranged in a circular pattern about the circumference of the bottom surface.

17. (Original) The relief valve of claim 14, wherein the diameter of the circular pattern is greater than the width of the opening in the passage.

18. (Original) The relief valve of claim 13, wherein the one or more through-holes are arranged on the valve member to inhibit fluid flow through the through-holes when the valve member is sealingly engaged with the seal surface.

19. (Cancelled) The relief valve of claim 18, wherein the through-holes are uniformly spaced about the valve member.

20. (Cancelled) The relief valve of claim 19, wherein the through-holes are commonly sized and shaped.

21. (Cancelled) The relief valve of claim 20, wherein the pattern of through-holes is circular in shape, and a diameter of the pattern is greater than the width of the opening in the passage.

22. (Currently Amended) A pressure relief valve comprising:

a housing having passage formed therein for connection with a fluid source and a seal surface positioned about an opening in the passage;

a housing cover having a cylindrical cavity formed therein, the housing cover engaging a base in a sealing relationship and enclosing the seal surface within the cavity, the cavity including a discharge opening for relieving pressurized fluid from the cavity during operation of the relief valve;

a disk-shaped valve member positioned within the cavity, the valve member being movable in a reciprocating manner along a center-line axis of the cavity such that a bottom surface of the valve member selectively engages the seal surface of the base in a sealing relationship, the cavity having a diameter approximate to the diameter of the valve member to substantially restrict movement of the valve member to a direction parallel to the center-line axis, the valve member having an arrangement of a plurality of through-holes formed therein, the holes being arranged in a circular pattern about the circumference of the bottom surface of the valve member, the circular pattern having a diameter greater than a width of the opening to inhibit fluid flow through the through-holes when the bottom surface of the valve member is sealingly engaged with the seal surface of the base in a closed position during normal operating conditions with the seal surface being engaged in the sealing relationship and when the valve member is separated from the seal surface, the through-holes permit fluid to flow through the valve member, the through-holes are commonly shaped and sized depending on the desired volume of fluid pressure to be relieved by the valve and the size of the opening in the passage and are symmetrically arranged in a circular pattern and evenly spaced about the circumference of the valve member such that the diameter of the circular pattern is greater than the width of the opening in the passage for allowing fluid to evenly dissipate through the valve member so that a proper alignment of the valve member is maintained as the valve member moves from the closed position to an open position; and

a spring coupled to the valve member and to the housing cover, the spring applying a predetermined spring force to the valve member to bias the valve member into contact with the seal surface, said predetermined spring force maintaining the valve member in the closed position during the normal operating conditions and wherein the valve member separates from the seal surface upon application of a fluid pressure force on the valve member that is greater than the predetermined spring force thereby allowing pressurized fluid to pass through the through-holes in the valve member and out of the valve through the discharge opening in the housing cover when an over pressure condition exists by the fluid pressure exceeding the predetermined spring force.